

1. INTRODUCTION

1.1 OVERVIEW

As Washington State Ferries steers forward into the 21st century, it faces many challenges in upholding its vision "to be the most efficient, affordable, customer-focused ferry operator in the world." Whether managing existing demand, programming service to meet future growth, securing new capital funds, reducing operating costs, or maintaining its aging fleet and terminal facilities, Washington State Ferries (WSF) must understand the needs and travel patterns of its customers to achieve its vision.

To this end, WSF embarked on a comprehensive, system-wide travel survey in the spring of 1999. The survey represents an update and expansion of the 1993 Origin-Destination Surveys effort. The impetus for the 1999 survey comes in part because WSF endeavors to obtain customer travel data to ensure that capital investments and service improvements included in the WSF Systems Plan are appropriate in light of a dynamic future, and also in response to the Department of Transportation Ferry System Performance Audit published in 1998. In particular, the performance audit requested that WSF's system-wide travel forecasting model be updated with a new origin-destination travel survey.

Planning for the 1999 WSF Travel Survey began in February 1999, and included process oversight by a technical advisory committee. The plan called for administering a travel survey to a sample of ferry users during weekdays and Sundays during the month of May. May was chosen not only to be comparable to the 1993 survey, but also because average daily ridership levels in May most closely approximate annual average daily ridership. A specific sampling plan was developed for conducting a census of all weekday PM peak riders on each route for a selected survey day, as well as a sample of vessel sailings to capture the representative travel patterns of weekday PM non-peak and Sunday users.

With a few notable exceptions, the 1999 WSF Travel Survey was administered as planned for the three survey periods during the month of May. Approximately 18,000 survey questionnaires were collected system-wide from weekday and Sunday passengers on the sampled vessel sailings. The questionnaires were screened for completeness and accuracy, and used to develop a comprehensive database of ferry user characteristics, including geographically coding the locations for each respondent's trip origin and destination to facilitate the mapping of travel patterns. This report presents the results and major findings from this survey research effort.

1.2 REPORT ORGANIZATION

The report is organized around four main sections following this introduction:

- Chapter 2 – Survey Methods and Results Application;
- Chapter 3 – System-wide Market Trends and Survey Results;
- Chapter 4 – Corridor Travel Markets; and
- Chapters 5-17 – Individual Route Analyses and Survey Results.

Chapter 2 presents a summary of the survey approach, methodology, and results applications to familiarize the interested reader about the survey process, including questionnaire development, sample design, survey periods, question coding, and data analysis. Various survey precision levels based upon question type and data subset are presented. Similarly, summary response statistics are provided and compared to similar figures from the 1993 survey. Additional information about the survey databases, including data contained and available formats are also provided, along with some general guidelines regarding the application of the survey data and results. Finally, Chapter 2 also touches on the geographic information system (GIS) elements of this survey, including the geocoding of key addresses to latitude-longitude (x-y) coordinates and the revisions made to the existing WSF Transportation Analysis Zone (TAZ) system.

Chapter 3 covers WSF market segments and system-wide trends through the presentation of overall survey results segmented by weekday versus weekend, peak versus off-peak times, user trip purposes, travel modes, frequency of use, and other relevant characteristics. Where possible comparisons to 1993 survey results were included in the 1999 system-wide analysis. The focus here is on the different global WSF market segments system-wide, rather than on the geographic and route differences within market segments, which are covered in subsequent chapters. Several system-wide map graphics are presented to illustrate key travel patterns of WSF users overall and by market segments.

Chapter 4 discusses survey results and market trends for groups of routes that together may be considered as representative of a travel corridor. As this analysis focused on the geographic nature of ferry passenger origin and destination locations, the outcome or corridor grouping of the ferry routes varies from that of the *1998 WSF Systems Plan*. Identified corridors are defined as one or more routes according to common characteristics. The emphasis is placed upon geographic and modal factors that segment WSF markets, and also considers the ferry and non-ferry travel alternatives of the corridors. However, information on travel characteristics and demographics is presented in this analysis as well.

The remaining chapters present key survey tabulations and analyses presented individually for each route. Herein, routes are generally defined as ferry service between any two departure and arrival terminals, except in the San Juan Islands, where service has been aggregated to a domestic and an international route to simplify the presentation of results. Similarly, ferry riders traveling between downtown Seattle and the South Kitsap Peninsula using both the Southworth-Vashon and Seattle-Vashon passenger-only routes via a transfer at Vashon Island have been placed into a virtual "Seattle-Southworth" route. These results are presented separately within the Seattle-Vashon passenger-only chapter. All tolled, this results in 13 route chapters, beginning with Chapter 5.

Each route chapter includes a range of tabulated results from general ferry rider characteristics to detailed travel patterns regarding access, boarding and egress modes by direction. Of particular interest are the ferry user origin-destination trip tables and accompanying maps which collectively show the locations and patterns served by each route. Additional tabulations and demographic information for each route is provided in Appendix D.

1.3 KEY FINDINGS

As a precursor to reading and reviewing the extensive analysis results and findings presented in the following chapters, this section highlights some of the key findings identified in analyzing the 1999 survey, including noteworthy differences between the 1999 survey results and those of the 1993 survey. In addition, most of the following key findings relate to system-wide trends or broad reaching results, though some corridor level and route-specific results are also presented.

1.3.1 General Findings

- WSF riders in 1999 were less willing to participate in the survey than those in 1993, but those that did completed the form more accurately.
- A shorter and improved questionnaire, combined with a prize drawing incentive for providing a complete home address led to 56% more “trip table usable” survey records – those with valid trip origin and destination address information and meeting other completeness criteria – than were obtained than in 1993.
- Overall, the survey achieved a 30% response rate, and of these responses, 82% were “trip table usable.”

1.3.2 System-Wide Findings

The following represent some of the key findings at a system-wide level based upon the detailed analyses presented in Chapter 3.

Trip Purpose

- About two-thirds of PM peak period trips, and one-half of PM non-peak period trips were being undertaken for work / school or business related purposes. The overall distribution of PM peak period trip purposes for the 1999 survey is very similar to the trip purpose distribution for the 1993 survey.
- 55% of all PM peak period trips were between work and home locations, and fully three-quarters of trips were to or from a home location.
- Nearly 75% of all Sunday survey period trips analyzed in the 1999 survey were for social/recreational/shopping/or sight-seeing purposes, and only 10% were for work/school commute or business-related reasons.

Frequency of Ferry Travel

- 50% of all weekday PM peak period riders made a one-way trip on the ferry six or more times in the previous week, including the trip on which they were surveyed. Frequency of use has increased since 1993, when about 40% of PM peak period respondents indicated making six or more one-way ferry trips in the past week, suggesting that some of the growth in ferry ridership is explained by existing riders traveling more often.
- Most Sunday survey period respondents (72%) reported making five or less one-way ferry trips in the past week.

Ferry Boarding Method and Terminal Access/Egress Modes

- Over 36% of weekday PM peak period riders boarded as pedestrians, more than double the Sunday survey period 14% share of walk-on riders. During the weekday PM non-peak hours, 26% of ferry riders were walk-ons.
- Average vehicle occupancy for those boarding in a vehicle averaged 1.48 persons for the weekday PM peak survey period, down a bit from 1993. This trend toward lower vehicle occupancy is also reflected in WSF ridership data from the month of May in both years, and suggests that WSF may want to bolster efforts to provide priority treatments for high occupancy vehicles (HOVs).
- Sunday walk-on patrons were considerably more likely to use a vehicle to access and/or egress the ferry terminal than their weekday counterparts.
- For weekday PM peak period walk-on riders, pedestrian modes were the most common means of terminal access (42%), though using a vehicle was the most common mode of terminal egress (50%).
- The 1999 survey results reflect a significant increase in the use of transit for access to and egress from the ferry terminals by walk-on passengers during the PM peak period.
- Specifically, nearly 24% of all PM peak period walk-on riders accessed the ferry terminal by bus or shuttle, up from 14% in 1993; and 32% departed the ferry terminal by transit, double the 16% in 1993. This is likely the result of improved transit service, timed ferry-bus connections, and ferry-bus passes implemented by Kitsap Transit and other transit agencies throughout the WSF service area.

Demographic Findings

- Both the weekday and Sunday surveys indicate that the average age of WSF riders has increased since the 1993 survey, reflecting the progression of the baby-boom generation.
- Nearly 55% of 1999 PM peak period riders were 45 years of age or older, compared to 45% in 1993.
- Among 1999 Sunday survey period respondents, the most often cited age group was 45 to 54 years, accounting for a 24% share. Conversely, the most reported age group in 1993 was 35 to 44 years, representing 25% of Sunday respondents.

Because some of the increase in WSF ridership over the past six years has come from existing riders increasing their usage frequency, maintaining these patrons while attracting new riders may be an important issue in the future. Based on the 1999 findings of increased transit usage by walk-on riders, continued and enhanced coordination between the WSF and transit agencies in the region could be important in maintaining and attracting new riders through the provision of seamless service. A small drop in average vehicle occupancy at the system-wide level (from 1.6 to 1.5) indicates the importance of continuing to provide priority treatments for HOV ferry riders.

1.3.3 Corridor Level Findings

The corridor analysis focused on ridership travel-sheds and the geographic characteristics that segment the WSF market based upon the patterns of trip origins and destinations

exhibited on groups of one or more routes. Only weekday PM peak period patterns were examined, and the corridor groupings are specific to this study and vary from those defined in the *1998 WSF Systems Plan* under different criteria. Below are a few of the key corridor level findings for the two multi-route corridors; additional analysis results and details along with a discussion regarding the methods and intent of the corridor level analysis can be found in Chapter 4. Chapter 4 also includes several telling map graphics for both the single- and multi-route corridors that cannot be easily summarized in the following findings.

Central Sound Corridor

This corridor is comprised of the four central cross-sound routes: the Seattle – Bremerton auto and passenger-only ferries, the Seattle – Bainbridge auto ferry route, and the Edmonds – Kingston auto ferry route.

- Within the PM peak period, the Central Sound corridor appears to be increasingly peak direction-oriented.
- The Seattle – Bremerton auto ferry route, which historically has exhibited more bi-directional ridership in the PM peak period than other routes, has reached a 74% share for westbound PM peak period riders, up from 62% westbound in 1993 .
- Nearly 80% PM peak period travel on the Seattle – Bainbridge route is westbound, up from 67% in 1993.
- About 40% of PM peak period riders in this corridor reported making 10 or more ferry trips in the past week.
- The Seattle – Bremerton auto and passenger-only ferry riders also exhibit a compact pattern of origin and destination locations, which is not seen in other Central Sound routes.
- With the exception of the Edmonds–Kingston route, about 14% of walk-on passengers reported parking a vehicle at *both* ends of the ferry route. The share of both side parking doubles to 32% for Edmonds–Kingston.
- Seattle-Bremerton passenger-only patrons reported waiting longer on average to board than the walk-on passengers of the parallel auto ferry; this willingness to wait likely reflects a preference for the notably shorter crossing time on the passenger-only route.

South Sound Corridor

The South Sound Corridor is comprised of the Southworth – Vashon, Fauntleroy – Vashon, and Fauntleroy – Southworth auto ferry routes, and the Seattle – Vashon passenger-only route.

- Trip purpose, origin and destination types, and frequency of use data indicate that the routes of this corridor are the most commuter-oriented of the entire WSF system.
- Nearly 80% of all PM peak period trips in the South Sound Corridor are for work/school commute or business-related purposes.
- One half of all riders in the South Sound Corridor reported making 10 or more one-way ferry trips in the past week.

- On average, PM peak period riders in South Sound Corridor exhibit a relatively compact pattern of origin and destination locations.
- The more outlying origins and destinations tended to be increasingly in Mason and northwest Pierce Counties.
- Given the commuter nature of the South Sound Corridor, the provision of frequent, fast and reliable ferry service during the AM and PM peak periods would appear to be of key interest to the riders in this market.
- Fully half of the PM peak period riders on the Seattle-Vashon passenger-only route transfer from/to the Southworth-Vashon auto ferry route to origins and destination in South Kitsap County and the surrounding region.
- Approximately one-quarter of all walk-on riders park a vehicle at *both* ends of the ferry route.

1.3.4 Selected Route Level Findings

The following highlights a few findings for individual routes, particularly for those routes that function as corridors that were not presented in the above multi-route corridor findings. Chapters 5-17 present a wealth of detail and analysis results regarding geographic travel patterns, trip purposes, and demographics for every route in the WSF system.

Of particular interest on several routes is the increase in transit use by walk-on riders for getting to and/or from the ferry terminals. This finding was particularly prevalent for routes with a west terminal in Kitsap County, where Kitsap Transit has made significant strides in coordinating transit service with ferry service and attracting riders since 1993. Clearly, these changes aimed at making multi-modal transit usage easier to undertake for commuters (as well as for off-peak and Sunday riders) has made a difference in bus and ferry usage compatibility. Considering the level of walk-on ridership on routes serving central Puget Sound, coupled with the increases in transit ridership among ferry users, future coordination between the WSF and transit agencies in the region could be important in maintaining and attracting new riders through the provision of seamless service.

Pt. Defiance - Tahlequah

- About 28% of PM peak period walk-on riders accessed the terminal by bus, compared to almost none in 1993. However, transit use to egress from the terminal (primarily at Tahlequah in the PM peak, where there is no transit service) remain unchanged in 1999.
- The South Tacoma area has replaced downtown Tacoma as the most reported westbound trip origin.
- Thirty percent of PM peak period walk-on passengers park a car on *both* sides.

Mukilteo - Clinton

- PM peak period walk-on riders using transit to access and/or egress the ferry terminals have nearly doubled since the 1993 survey.
- About 30% of PM peak period walk-on passengers park a car on *both* sides.
- Nearly 69% of PM peak period trips are westbound, essentially unchanged from 1993.

Port Townsend - Keystone

- The share of PM peak period riders making trips for work/school commute or business related purposes has increased from 25% in 1993 to 38% in 1999.
- Westbound destinations for PM peak period travel have become more dispersed, with a much lower percentage of riders destined for the immediate Port Townsend area in 1999 (16%) compared to 1993 (50%).
- Destinations for Sunday survey period respondents of the 1999 survey have shifted somewhat away from north and central Kitsap County and toward northeast Jefferson and Clallam Counties, and other west Olympic Peninsula places.

Anacortes – San Juan Islands

- Approximately 75% of daily riders reported infrequent or moderate usage (five or fewer one-way ferry trips in the past week), highlighting the self-contained nature of the San Juan community and the tourism orientation of the route
- The percentage of riders completing a round-trip in the same day is considerably less than other WSF routes, at less than 45% of daily travel, compared to typically three-quarters of PM peak period riders making daily round-trips on the remaining routes (excluding Sidney, B.C.)
- The percentage of walk-on riders that access and/or egress the ferry terminals by vehicle has increased from less than two-thirds in 1993 to three-quarters in 1999.

Anacortes – Sidney, B.C.

- The Anacortes-Sidney route has a very low share of walk-on passengers, and consequently the highest reported average vehicle occupancy of any route, at 2.8 persons on weekdays.
- Only 12% of weekday riders indicated a work/school commute or business-related trip purpose.
- The city of Victoria represents 82% of eastbound origins and 60% of westbound destinations for weekday riders on the international ferry route.

